

217/782-2113

FEDERALLY ENFORCEABLE STATE OPERATING PERMIT - NSPS SOURCE

PERMITTEE

IIT Cogeneration Plant
Attn: Chuck Bessler
3430 South Federal
Chicago, Illinois 60616

Application No.: 00010044

I.D. No.: 031600AVA

Applicant's Designation:

Date Received: January 13, 2000

Subject: Turbines, Boilers, and Burners

Date Issued:

Expiration Date:

Location: 3430 South Federal, Chicago, 60616

This permit is hereby granted to the above-designated Permittee to OPERATE emission unit(s) and/or air pollution control equipment consisting of two natural gas fired/#2 fuel oil stationary turbines with water injection control (42 mmBtu/hour, each), two gas fired duct burners (82 mmBtu/hour, each), and two gas fired boilers (80 and 31 mmBtu/hour) pursuant to the above-referenced application. This Permit is subject to standard conditions attached hereto and the following special condition(s):

- 1a. This federally enforceable state operating permit is issued to limit the emissions of air pollutants from the source to less than major source thresholds (i.e., 100 tons/year for nitrogen oxide (NO_x) and carbon monoxide (CO)). As a result the source is excluded from the requirement to obtain a Clean Air Act Permit Program (CAAPP) permit. The maximum emissions of this source, as limited by the conditions of this permit, are described in Attachment A.
- b. Prior to issuance, a draft of this permit has undergone a public notice and comment period.
- c. This permit supersedes all operating permits issued for this location.
- 2a. The boilers and burners are subject to a New Source Performance Standard (NSPS) for Small Industrial - Commercial - Institutional Steam Generating Units, 40 CFR 60, Subparts A and Dc. The Illinois EPA is administering NSPS in Illinois on behalf of the United States EPA under a delegation agreement.
- b. The turbines are subject to a New Source Performance Standard (NSPS) for Stationary Gas Turbines, 40 CFR 60, Subparts A and GG. The Illinois EPA is administering NSPS in Illinois on behalf of the United States EPA under a delegation agreement.
- c. At all times, the Permittee shall maintain and operate the boilers, burners, and turbines in a manner consistent with good air pollution control practice for minimizing emissions, pursuant to the NSPS, 40 CFR 60.11(d).

- 3a. Emissions and operation of turbine #1 shall not exceed the following limits:

<u>Material</u>	<u>Usage (mmscf/Yr)</u>	<u>Pollutant</u>	<u>Emission Factor (lb/mmscf)</u>	<u>Emissions (Tons/Yr)</u>
Natural Gas	10.0	NO _x	173.4	0.87
		CO	30.6	0.15
		PM	6.7	0.04
		SO ₂	3.5	0.02
		VOM	2.1	0.01

<u>Material</u>	<u>Usage (Gal/Yr)</u>	<u>Pollutant</u>	<u>Emission Factor (lb/Gal)</u>	<u>Emissions (Tons/Yr)</u>
Fuel Oil #2	150,000	NO _x	0.024	1.83
		CO	0.033	2.47
		PM	0.002	0.13
		SO ₂	0.039	2.95
		VOM	0.00006	0.004

- b. Emissions and operation of the turbine #2 shall not exceed the following limits:

<u>Material</u>	<u>Usage (mmscf/Yr)</u>	<u>Pollutant</u>	<u>Emission Factor (lb/mmscf)</u>	<u>Emissions (Tons/Yr)</u>
Natural Gas	10.0	NO _x	164.2	0.82
		CO	30.6	0.15
		PM	6.7	0.04
		SO ₂	3.5	0.02
		VOM	2.1	0.01

<u>Material</u>	<u>Usage (Gal/Yr)</u>	<u>Pollutant</u>	<u>Emission Factor (lb/Gal)</u>	<u>Emissions (T/Yr)</u>
Fuel Oil #2	150,000	NO _x	0.027	2.02
		CO	0.031	2.35
		PM	0.002	0.13
		SO ₂	0.039	2.95
		VOM	0.00006	0.004

These limits define the potential emissions of NO_x, CO, PM, SO₂, and VOM and are based on maximum fuel usage, standard emission factors, and stack test results. Compliance with annual limits shall be determined from a running total of 12 months of data.

- c. Natural gas shall be the primary fuel and #2 fuel oil shall be used as a back up in the two turbines. Use of any other fuel other than natural gas or #2 fuel oil requires a permit change.
- 4a. Emissions and operation of the two boilers and two duct burners shall not exceed the following limits:

<u>Material</u>	<u>Usage</u>		<u>Pollutant</u>	<u>Emission Factor (lb/mmscf)</u>	<u>Emissions</u>	
	<u>(mmscf/Mo)</u>	<u>(mmscf/Yr)</u>			<u>(T/Mo)</u>	<u>(T/Yr)</u>
Natural Gas	245	1,465	NO _x	100	12.3	73.3
			CO	84	10.3	61.6
			PM	7.6	1.0	5.6
			SO ₂	0.6	0.1	0.5
			VOM	5.5	0.7	4.1

These limits define the actual emissions of NO_x, CO, PM, SO₂, and VOM and are based on maximum material usage and standard emission factors. Compliance with annual limits shall be determined from a running total of 12 months of data.

- b. Natural gas shall be the only fuel combusted in the two boilers and two burners. Use of any other fuel other than natural gas requires a permit revision.
- 5. The emissions of Hazardous Air Pollutants (HAP) as listed in Section 112(b) of the Clean Air Act shall be less than 10 tons/year of any single HAP and 25 tons/year of any combination of such HAPs. As a result of this condition, this permit is issued based on the emissions of all HAPs from this source not triggering the requirements to obtain a Clean Air Act Permit Program Permit (CAAPP), and Section 112(G) of the Clean Air Act.
- 6a. The Permittee shall comply with the following standards for nitrogen oxides pursuant to 40 CFR 60.332(a)(2). The Permittee shall not emit into the atmosphere from any stationary gas turbine, any gases which contain nitrogen oxides in excess of the following equation, except as allowed by 40 CFR 60.332(f):

$$STD = 0.0150 \frac{(14.4)}{Y} + F$$

where:

STD = allowable NO_x emissions (percent by volume at 15 percent oxygen and on a dry basis).

Y = manufacturer's rate heat rate at manufacturer's rated peak load (kilojoules per watt hour), or actual measured heat rate based on lower heating value of fuel as measured at actual peak load for

the facility. The value of Y shall not exceed 14.4 kilojoules per watt hour.

F = NO_x emission allowance for fuel-bound nitrogen as defined in paragraph (a) (3) of this section.

F shall be defined according to the nitrogen content of the fuel as follow:

Fuel-bound nitrogen (percent by weight)	F (NO _x percent by volume)
NO.015	0
0.015 < NO. 1	0.04 (N)
0.1 < NO. 25	0.004 + 0.0067 (N-0.1)
N > 0.25	0.005

where:

N = the nitrogen content of the fuel (percent by weight).

- b. Pursuant to 40 CFR 60.332(f), stationary gas turbines using water or steam injection for control of NO_x emissions are exempt from paragraph 40 CFR 60.332(a) (2) when ice fog is deemed a traffic hazard by the owner or operator of the gas turbine.
- c. Pursuant to 40 CFR 60.332(k), stationary gas turbines with a heat input greater than or equal to 10.7 gigajoules per hour (10 million Btu/hour) when fired with natural gas are exempt from 40 CFR 60.332(a) (2) when being fired with an emergency fuel.
7. The Permittee shall not emit into the atmosphere from any turbine any gases which contain sulfur dioxide (SO₂) in excess of 0.015 percent by volume at 15 percent oxygen and on a dry basis, or shall not burn any fuel which contains sulfur in excess of 0.8 percent by weight, pursuant to 40 CFR 60.333(a) and (b).
8. The Permittee shall comply with the following monitoring requirements pursuant to 40 CFR 60.334:
 - a. The Permittee using water injection to control NO_x emissions shall install and operate a continuous monitoring system to monitor and record the fuel consumption and the ratio of water to fuel being fired in the turbine. This system shall be accurate to within ±5.0 percent and shall be approved by the Administrator.
 - b. The Permittee shall monitor sulfur content and nitrogen content of the fuel being fired in the turbine. The frequency of determination of these values shall be as follows:
 - i. If the turbine is supplied its fuel from a bulk storage tank, the values shall be determined on each occasion that

fuel is transferred to the storage tank from any other source.

- ii. If the turbine is supplied its fuel without intermediate bulk storage the values shall be determined and recorded daily. Owners, operators, or fuel vendors may develop custom schedules for determination of the values based on the design and operation of the affected facility and the characteristics of the fuel supply. These custom schedules shall be substantiated with data and must be approved by the Administrator before they can be used to comply with paragraph (b) of this section.
- c. For the purpose of reports required under § 60.7(c), periods of excess emissions that shall be reported are defined as follows:
- i. Nitrogen oxides. Any one-hour period during which the average water-to-fuel ratio, as measured by the continuous monitoring system, falls below the water-to-fuel ratio determined to demonstrate compliance with § 60.332 by the performance test required in § 60.8 or any period during which the fuel-bound nitrogen of the fuel is greater than the maximum nitrogen content allowed by the fuel-bound nitrogen allowance used during the performance test required in § 60.8. Each report shall include the average water-to-fuel ratio, average fuel consumption, ambient conditions, gas turbine load, and nitrogen content of the fuel during the period of excess emissions, and the graphs or figures developed under § 60.335(a).
 - ii. Sulfur dioxide. Any daily period during which the sulfur content of the fuel being fired in the gas turbine exceeds 0.8 percent.
 - iii. Ice fog. Each period during which an exemption provided in § 60.332(f) is in effect shall be reported in writing to the Administrator quarterly. For each period the ambient conditions existing during the period, the date and time the air pollution control system was deactivated, and the date and time the air pollution control system was reactivated shall be reported. All quarterly reports shall be postmarked by the 30th day following the end of each calendar quarter.
9. The Permittee shall comply with the test methods and procedures requirements pursuant to 40 CFR 60.332 to demonstrate compliance with 40 CFR 60.332 and 60.333.
10. The Permittee shall fulfill applicable notification and recordkeeping requirements of the NSPS, 40 CFR 60.7 for the boilers and burners.

11. The Permittee shall not utilize distillate fuel oil (Grades No. 1 and 2) in the boiler with a sulfur content of greater than the larger of the following two values pursuant to 35 Ill. Adm. Code 214:
 - a. 0.28 weight percent, or
 - b. The weight percent given by the formula: Maximum weight percent sulfur = $(0.000015) \times (\text{Gross heating value of oil, Btu/lb})$.
12. The Permittee shall, in accordance with the manufacturer(s) and/or vendor(s) recommendations, perform periodic maintenance on the pollution control equipment covered under this permit such that the pollution control equipment be kept in proper working condition and not cause a violation of the Environmental Protection Act or regulations promulgated therein.
13. In the event that the operation of this emission unit results in an odor nuisance, the Permittee shall take appropriate and necessary actions to minimize odors, including but not limited to, changes in raw material or installation of controls, in order to eliminate the odor nuisance.
14. The Permittee shall maintain records of the following items:
 - a. Fuel oil usage for the two turbines (gallons/month and gallons/year);
 - b. Natural gas usage for the two boilers, two burners, and two turbines (mmscf/month and mmscf/year); and
 - c. Detailed calculations of nitrogen oxide and carbon monoxide emissions (tons/month and tons/year).
15. All records and logs required by this permit shall be retained at a readily accessible location at the source for at least three years from the date of entry and shall be made available for inspection and copying by the Illinois EPA or USEPA upon request. Any records retained in an electronic format (e.g., computer) shall be capable of being retrieved and printed on paper during normal source office hours so as to be able to respond to an Illinois EPA or USEPA request for records during the course of a source inspection.
16. If there is an exceedance of the requirements of this permit as determined by the records required by this permit, the Permittee shall submit a report to the Illinois EPA's Compliance Section in Springfield, Illinois within 30 days after the exceedance. The report shall include the emissions released in accordance with the recordkeeping requirements, a copy of the relevant records, and a description of the exceedance or violation and efforts to reduce emissions and future occurrences.

17. Two (2) copies of required reports and notifications concerning equipment operation or repairs, performance testing or a continuous monitoring system shall be sent to:

Illinois Environmental Protection Agency
Division of Air Pollution Control
Compliance Section (#40)
P.O. Box 19276
Springfield, Illinois 62794-9276

and one (1) copy shall be sent to the Illinois EPA's regional office at the following address unless otherwise indicated:

Illinois Environmental Protection Agency
Division of Air Pollution Control
9511 West Harrison
Des Plaines, Illinois 60016

18. The Permittee shall submit the following additional information with the Annual Emissions Report, due May 1st of each year: Fuel oil usage for the two turbines (gallons/month and gallons/year) and natural gas usage for the two boilers, two burners, and two turbines (mmscf/month and mmscf/year). If there have been no exceedances during the prior calendar year, the Annual Emission Report shall include a statement to that effect.

If you have any questions on this, please call Tara T. Nguyen-Ede at 217/782-2113.

Donald E. Sutton, P.E.
Manager, Permit Section
Division of Air Pollution Control

DES:TNE:psj

cc: Illinois EPA, FOS Region 1
Illinois EPA, Compliance Section
Lotus Notes

Attachment A - Emission Summary

This attachment provides a summary of the maximum emissions from cogeneration plant operating in compliance with the requirements of this federally enforceable permit. In preparing this summary, the Illinois EPA used the annual operating scenario which results in maximum emissions from such a plant. The resulting maximum emissions are well below the levels, e.g., 100 tons/year for nitrogen oxide (NO_x) and carbon monoxide (CO) at which this source would be considered a major source for purposes of the Clean Air Act Permit Program. Actual emissions from this source will be less than predicted in this summary to the extent that less material is handled, and control measures are more effective than required in this permit.

- 1a. Emissions and operation of turbine #1 shall not exceed the following limits:

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		CO	0.033	2.47
		PM	0.002	0.13
		SO ₂	0.039	2.95
		VOM	0.00006	0.004

- b. Emissions and operation of the turbine #2 shall not exceed the following limits:

<u>Material</u>	<u>Usage (mmscf/Yr)</u>	<u>Pollutant</u>	<u>Emission Factor (lb/mmscf)</u>	<u>Emissions (Tons/Yr)</u>
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